



HPS OUTDOOR POWER Transformers

Transformer technology, like many other technologies, has evolved over the last 50 years. However, some technological advancements, observed as instantaneous breakthroughs, have resulted in setbacks and risks, years or decades later. Liquid filled (specifically PCB filled) transformers have caused environmental problems due to leaks, and other problems have caused investors to seek other alternatives to cool transformers.

Regulations

By the end of 2009, in Canada, all PCB filled transformers must be replaced (already applies to the U.S.). Three main contenders for replacing PCB-filled transformers are namely mineral oil, silicone and dry-type transformers.

Dry-type Transformers

Dry-type transformers are a great alternative available to replace PCB-filled transformers. In dry-type transformers, air is used as the cooling and dielectric medium. In the last 25 years, this transformer has received considerable technological improvements because of its attention in the market place.

HPS has a complete line of Outdoor Power transformers. HPS power transformers are regarded for their high level of quality and service reliability that has become synonymous with HPS transformer products.

HPS Outdoor Dry-Type Power Ratings

- kVA rating: 300 kVA-35 MVA
- Frequency: 60 [50] [other] Hertz
- up to 44kV class
- up to 250kV BIL
- up to 1800 Amps secondary current
- Enclosures: EEMAC, NEMA3R or NEMA4

Applications

- Power Stations
- Utility Power Generation
- Drilling Platforms
- Network Vaults
- Fenced Electrical Areas





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Criteria for selecting an Outdoor Power Transformer

	Oil Filled Transformers	HPS Dry-Type Transformers
Fire Risks	- Oil is highly flammable (300°C)	- Low rate of fire propagation (Copper 450°C, Aluminum 350°C).
Health & Environmental Concerns	- PCB's have been linked with many health risks and environmental issues.	- Dry-type's use air as a coolant and hence, health and environment concerns disappear.
Insulation	- Kraft paper is the insulation material used. Kraft paper along with mineral oil, make them suitable for very high voltages.	- Nomex® is the major insulation material, which has very high dielectric tensile and compression strength. This tougher insulating material along with the impregnation process, improves the short circuit mechanical strength over liquid cooled transformers.
Performance Comparison	- No-load losses tend to be slightly lower. - Slightly lower audible sound level.	- Overall dimensions of dry-type transformers are smaller. This is possible as dry-type transformers do not require space for cooling radiators or transition cells.
Installation	- Disconnecting chambers are often required resulting in additional cost. - Require catch basins or curbs to contain the liquid in case of a leak. - The heat release rate of the liquid may require more air space above and surrounding the transformer. - Not intended for installation in public areas.	- No radiator banks are used which makes it easy to terminate bus work in any desired location. - Not intended for installation in public areas.
Maintenance Considerations	- Periodic inspection for leaks and rust is required. - Gauges and fan operation have to be examined annually. - Repairs on site are often not practical.	- Require an annual inspection and cleaning of dust. - Easily inspected and minor repairs can be concluded on site.

For outdoor applications, up to 250 kV BIL and up to 35 MVA (45 MVA with additional fan cooling), dry-type transformers offer the most cost effective solution with many design advantages and pose no environmental or health risks.



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